

[036] Fig. 1 is a diagram with time based curves of transmission speeds of rotation relevant to the upshifting procedure, [[and]]

[037] Fig. 2 is a diagram, similar to Fig. 1, however, with explanatory comments for the determination of the rate of change of the transmission speed of rotation, and

Fig. 3 shows the various components which are controlled and regulated by the method according to the present invention.

[039] In the diagram presented in Fig. 1 is to be seen a curve of the transmission input speed of rotation 1, plotted against time during an upshift procedure. As is customary, during such upshift procedures, the transmission input speed of rotation is braked down from a comparative high speed of rotation level by way of the braking action of a transmission brake (~~not shown~~) 12 to the extent, that this corresponds to a set transmission input speed of rotation 2 or approaches very close to this value. This set transmission input speed of rotation 2 finds itself in a synchronized run, speed of rotation window 4, upon the attainment of which, fundamentally, a mechanical coupling of the transmission member for the next high transmission gear stage is possible.

[048]        The various components, which are controlled and regulated by the method according to the present invention, are shown in Fig. 3. The automatic transmission 13 is constructed with a countershaft 14, having a transmission input shaft 15, with at least one countershaft 14 driven by the transmission input shaft 15 and with a transmission output shaft 16. Loose 17 and/or fixed gears 18 are supported upon the transmission input shaft 15, the countershaft 14 and/or on the transmission output shaft 16 which mesh with one another. A coupling apparatus 19 is provided for coupling the loose gears 17 and carrying out of a gear change. The transmission brake 12 is controlled by a control device 20 and is provided for braking the countershaft 14.

Reference numerals

- 1 transmission input speed of rotation
- 2 set transmission input speed of rotation
- 3 targeted speed of rotation window
- 4 synchronized run speed of rotation window
- 5 curve of the transmission input speed of rotation leads to no change of the lead time
- 6 curve of the transmission input speed of rotation leads to a lengthening of the lead time
- 7 curve of the transmission input speed of rotation leads to a lessening of the lead time
- 8 possible curve of the transmission input speed of rotation
- 9 mid-point of the targeted speed of rotation window
- 10 determination of the maximum rate of change of the transmission input speed of rotation
- 11 speed of rotation difference between the speed of rotation of the engagement procedure and the mid-point of the set speed of rotation window.
- 12 transmission brake ❖
- 13 automatic transmission ❖
- 14 countershaft ❖
- 15 transmission input shaft ❖
- 16 transmission output shaft ❖
- 17 loose gear ❖
- 18 fixed gear ❖
- 19 coupling apparatus ❖
- 20 control device ❖